

REMARKS

Present Status of the Application

Claims 1-15 remain pending of which claims 1 and 8 have been amended, to more explicitly and more clearly describe the claimed invention. Support for the amendments can be found on page 4, lines 22-23, on page 7, lines 11-12, and on page 7, lines 21-22. It is believed that no new matter adds by way of these amendments made to the claims or specification or otherwise to the application. For at least the following reasons, Applicants respectfully submit that claims 1-15 are in proper condition for allowance. Reconsideration is respectfully requested.

Response to Rejections under 35 U. S. C. 103

1. The Office Action rejected claims 1-3 and 22-24 under 35 U.S.C. 103(a) as being unpatentable over Yamaha et al. (US-6,297,563, hereinafter Yamaha).

Applicant respectfully disagrees and traverses the above rejections as set forth below. Independent claim 1 is allowable for at least the reason that Yamaha failed to teach, suggest or disclose every features of the claimed invention. More specifically, Yamaha failed to teach, suggest or disclose at least "a plurality of via plugs for linking up said current conduction structure and said support structure with said bonding pad layer, as required by claim 1". The technical impact of the above structure is that it provides substantial mechanical support, therefore damage to the bonding pad structure can be effectively reduced or eliminated. Therefore, the reliability of semiconductor device can be effective promoted.

To the contrary, substantially, Yamaha failed to show a structure which is equivalent of the claimed invention (please see FIG. 1 of Yamaha), instead substantially, Yamaha failed to show any bonding pad layer not to mention a plurality of support plugs linking up with the structure A and the structure B with the bonding pad layer. In other words, Yamaha failed to teach, suggest or disclose at least “a plurality of via plugs for linking up said current conduction structure and said support structure with said bonding pad layer, as required by claim 1”.

Further, claim 1 requires “a current conduction structure over the device section; and a mechanical support structure over the non-device section” so that the stress can be evenly distributed over the substrate, thus damage to the bonding pad structure due to stress can be effectively eliminated. Thus, reliability of the device can be further promoted. To the contrary, there is no disclosure equivalent to “a current conduction structure over the device section; and a mechanical support structure over the non-device section, as required by claim 1”. Accordingly, Applicant respectfully submit that Yamaha cannot meet claim 1 in this regard.

For at least the foregoing reason, Applicant respectfully submits that claims 1-7 patently define over Yamaha. Reconsideration is respectfully requested.

2. The Office Action rejected claims 8-15 under 35 U. S. C. 103(a) as being unpatentable over Yamaha in view of Lu et al. (US-6,100,573, hereinafter Lu).

In rejecting the above claims, the Office Action asserted that Yamaha discloses the claimed invention except for the metallic layers in both structures A and B are directly contact with the substrate. Lu et al. discloses the first metallic layers 304 are directly contact with the substrate 300. Therefore, it would have been obvious to a

skilled artisan at the time of the invention to provide a provide the structure with the substrate directly connected to the bonding pad as show.

Applicants respectfully disagree and would like to point out that since Yamaha failed to teach, suggest or disclose every features of claim 1, for reason discussed in paragraph 1, above, and because independent claim 8 also include similar features of claim 1, therefore claim 8 is also allowable over Yamaha for the same reason. More specifically, substantially both Yamaha failed to teach, suggest or disclose at least “a plurality of via plugs for linking up said current conduction structure and said support structure with said bonding pad layer”, as required by claim 8.

Further, because the Office Action relied upon Lu to show a plurality of plugs attaching with a substrate, still Lu cannot cure the specific deficiencies of Yamaha. Accordingly, Applicant respectfully submits that no combination of Yamaha and Lu can make the claimed invention.

Further, claim 8 requires “a current conduction structure over the device section; and a mechanical support structure over the non-device section” so that the stress can be evenly distributed over the substrate, thus damage to the bonding pad structure due to stress can be effectively eliminated. Thus, reliability of the device can be further promoted. To the contrary, there is no disclosure equivalent to “a current conduction structure over the device section; and a mechanical support structure over the non-device section, as required by claim 8”. Accordingly, Applicant respectfully submit that no combination of Yamaha and Lu can make the claimed invention.

Accordingly, Applicant respectfully submit claims 8-15 patently define over Yamaha and Lu. Reconsideration and withdrawal of these rejections is respectfully requested.

CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 1-15 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

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Version with markings to show changes made

In The Claims

1. (Amended) A bonding pad structure, comprising:

a substrate having at least a device section and a non-device section;

a bonding pad layer above the substrate;

a current conduction structure over the device section, between the bonding pad layer and the substrate for connecting the bonding pad layer and the substrate electrically, wherein the current conduction structure includes:

a plurality of conductive metallic layers, wherein each conductive metallic layer is at a different height level from the substrate; and

a plurality of conductive plugs for linking neighboring conductive metallic layers and the conductive metallic layers with the bonding pad layer and the substrate;

a mechanical support structure over the non-device section, between the bonding pad layer and the substrate, wherein the mechanical support structure includes:

a plurality of support metallic layers, wherein each support metallic layer is at a different height level from the substrate; and

a plurality of support plugs for linking up neighboring support metallic layers and the support metallic layers with the bonding pad layer and the substrate; [and]

a plurality of via plugs for linking up said current conduction structure and said mechanical support structure with said bonding pad layer; and

an insulation layer between the bonding pad layer, the current conduction structure, the mechanical support structure and the substrate for isolating the current conduction structure from the mechanical support structure.

8. (Amended) A bonding pad structure, comprising:

a substrate having at least a device section and a non-device section;

a bonding pad layer above the substrate;

a current conduction structure over the device section, between the bonding pad layer and the substrate for connecting the bonding pad layer and the substrate electrically, wherein the current conduction structure includes:

a plurality of conductive metallic layer, wherein each conductive metallic layer is at a different height level from the substrate and one of the conductive metallic layers is in direct contact with the substrate; and

a plurality of conductive plugs for linking neighboring conductive metallic layers and linking one of the conductive metallic layers with the bonding pad layer;

a mechanical support structure over the non-device section, between the bonding pad layer and the substrate, wherein the mechanical support structure includes:

a plurality of support metallic layers, wherein each support metallic layer is at a different height level from the substrate and one of the support metallic layers is in direct contact with the substrate; and

a plurality of support plugs for linking neighboring support metallic layers and linking one of the support metallic layers with the bonding pad layer; [and]

a plurality of via plugs for linking up said current conduction structure and said mechanical support structure with said bonding pad layer; and

an insulation layer between the bonding pad layer, the current conduction structure, the mechanical support structure and the substrate for isolating the current conduction structure from the mechanical support structure.